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The unholy spiral (working paper): a social constructivist analysis of the political economy of environmental degradation and a possible strategy for local action

Working paper

The Unholy Spiral (Working Paper): A Social Constructivist Analysis of the Political Economy of Environmental Degradation and a Possible Strategy for Local Action

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1. INTRODUCTION

In this informal paper I bring together several lines of argument that appear to converge on a possible diagnosis for the disastrous effects of today's political economy landscape on many people's lives, on many communities, and on the environment. Although I did choose a particular analytical lens – social constructivism – to develop my argument, I tried to follow to the best of my ability a structural analysis rather than ideological choices or positions. A basic level of ethical choice is implicitly or explicitly invoked, for example to say that extreme imbalances in market power, even if they may be perfectly legal, appear to have deleterious effects on smaller economic players and on the environment; and that, for this reason, there is something 'wrong' with them. When such value judgements are made, however, I emphasize their structural causes more than their moral or ethical motivations, even though it would not be entirely truthful to claim that the latter do no play a part.

As a radically interdisciplinary researcher with initial training in aerospace engineering and experience in physics pedagogy, board-level electronic design, interdisciplinary media research, social science, theoretical computer science, and applied mathematics, I bring to this exercise 25 years of experience in building bridges across disciplines rather than a formal training in social science and, more to the point, in social theory, economic theory, and political theory. My argument is therefore necessarily sketchy and my bibliography incomplete. This short document should be regarded as a working paper rather than a complete academic study. In particular, it still lacks an empirical study of the main example that I discuss in the later parts of the paper, the www.sardex.net credit system. One such study is planned for later this year.

The main purpose of this paper, in its present form or later in a more complete form, is to stimulate debate and productive collaborations with other researchers from disciplines relevant to this discussion, which is conducted entirely within the bounds of social science. For these reasons the title promises more than this version of the paper currently delivers.

For added context, especially for non-social scientists, it helps to explain how I arrived at the ideas presented here by following a roughly historical or chronological narrative that tracks the most important moments in my 'discovery' of social science. Some of the points and figures discussed here have already been presented in Dini et al. (2011), Breitstein and Dini (2011), Dini (2012), and Dini and Sartori (2013). Section 2 should be seen as a 'tutorial' that provides a sketch of the theoretical landscape of social science, which is needed to elaborate the points made later in the paper and is meant to make the paper relatively self-contained. The section starts by defining basic terms and concepts, laying out a first meta-theoretical framework organized around the two dichotomies *objectivism*/*subjectivism* and *individualism*/*holism* that is meant to help in the 'decoding' of social science writings and ideas. The next subsection introduces *conflict* as a third fundamental dimension of social science and elaborates briefly on the implications for political theory and political engagement. I then add a fourth dimension, *value*, and invoke economic anthropology as a rich and fruitful theory through which phenomena like open source and the Commons can be understood. The final part of this section addresses issues of scale through processes of institutionalization.

Building on this basic set of analytical tools, Section 3 gives a very brief summary of the main points of David Graeber's book on an anthropological history of debt (2011), which plays a central role in this paper. This section ends with a definition of the 'unholy spiral', a concept that draws on all the references cited in this paper. After acknowledging the heroic efforts of traditional cultures that are particularly close to the environment, such as the Canadian First Nation tribes, in surviving the consequences of the current composition of the capitalist economy, Section 4 outlines a possible strategy for local action, that I call the social construction of economic identity, through a particular kind of alternative currency. This approach at local action appears to enable a moderate level of insulation from and constructive engagement with the political economy forces at play, contributes to positive GDP accounting and tax revenue, remains embedded in and reinforces social structure, and carries the potential for wider cultural transformation. Section 5 draws some conclusions.

2. THE DIMENSIONS OF SOCIAL SCIENCE

Ontology and Epistemology

An engineer or 'hard' scientist starting to work in social science will sooner or later encounter a 'fundamental' problem: paraphrasing Anthony Giddens, the difficult aspect of social science is that, unlike what happens in physics, the object of research has *opinions* about what is being said about them. How many opinions? As many as there are individuals. The apparently insurmountable challenge of accounting for as many opinions as there are individuals can be approached constructively (no pun intended!) through a relatively newer area of social science that is inspired by hermeneutic ('interpretative') philosophy. A popular theoretical perspective that belongs to this current is *social constructivism* (Berger and Luckmann, 1966):

> To say of something that it is socially constructed is to emphasize its dependence on contingent aspects of our social selves. It is to say: This thing could not have existed had we not built it; and we need not have built it at all, at least not in its present form. Had we been a different kind of society, had we had different needs, values, or interests, we might well have built a different kind of thing, or built this one differently. The inevitable contrast is with a naturally existing object,

> something that exists independently of us and which we did not have a hand in shaping. There are certainly many things, and facts about them, that are socially constructed in the sense specified by this core idea: money, citizenship and newspapers, for example. None of these things could have existed without society; and each of them could have been constructed differently had we so chosen. (Boghossian, 2001)

Thus, subjective hermeneutics and social constructivist processes can be juxtaposed to the objectivism of physics to create consensual agreements that acquire the status of 'reality' in social life as much as trees and rocks are 'real' in physical life. A set of beliefs about the constitution of reality defines an *ontology*. Thus, where physics relies on an objectivist ontology and phenomenology assumes a subjectivist ontology, social constructivism can be regarded as a half-way point between these extremes, or an *inter-subjective* ontology, to use Karl Popper's term. An inter-subjective or socially constructed ontology, therefore, can be said to emerge as the result of a social process mediated by language.

Similar distinctions apply to the construction of knowledge, or *epistemology*. In the hard sciences, knowledge is constructed through quantitative theories and observations, whereas in the hermeneutics tradition knowledge, like reality, is constructed through social processes mediated by language. Of course, much of the knowledge in the hard sciences is *also* created in this manner, as explained by Thomas Kuhn (1996), but not all such scientists are fully aware of this as they tend to lack in *reflexivity*.

Following Hollis (1994), Figure 1 shows these different perspectives in social science as two columns in a two-dimensional diagram. The blue boxes indicate some of the social science epistemologies that we are discussing. A few indicative names are shown to make the table easier to interpret. The left-hand column is generally associated with the rationalist, deterministic tradition. In Western thought it is the older of the two, and grew out of naturalistic philosophy. The right-hand column is more recent, reflecting a greater emphasis on the social world in defining reality (ontology) and the construction of knowledge (epistemology). Although interpreting the two columns as an objective-subjective dichotomy risks gross oversimplification, those in the left-hand column can be grouped loosely as sharing a belief in some form of 'objective' reality, whereas a more 'subjective' perspective permeates the ideas of those named in the right column. The column on the left is generally acknowledged to have a much greater constituency (and to attract more funding) within social science than the traditions on the right that are inspired in part by a hermeneutic (i.e. interpretative) philosophy.

The table can also be understood in terms of different accounts of social systems and human action. The top row favours a view of society and the economy that is biased toward the importance of structures and systems over individuals, whereas the bottom row represents the opposite emphasis. This distinction is reflected in methodology in the sense that theories in the top row tend to be deductive, deriving behaviour from general principles and structures, whereas the bottom row is associated with the tradition of empiricism and positivism, where general principles are derived from experience through an inductive and emergent process.

An example of the deep epistemological gap between the two columns can be seen in the incommensurabily between the construction of mathematical knowledge through theorem proving and the insights gained through qualitative methods in sociology such as in-depth interviews and ethnography. As discussed in Dini and Sartori (2013) and in Dini et al. (2011), in some cases this epistemological gap, which is not an immediate concern for us here, can be bridged by developing a common methodology or by collaborating towards a practical joint endeavour.

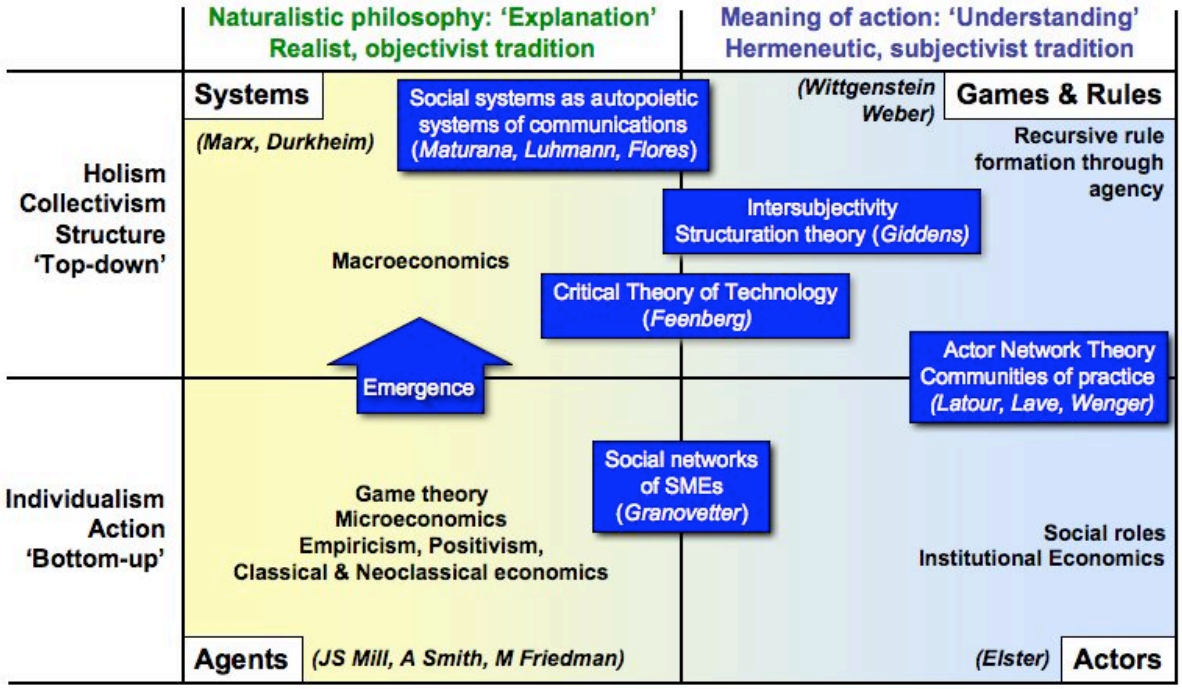

Figure 1: Hollis's map of social science (1994)

Conflict and Radical Democracy

Another very useful reference that provides some bearings for how to orient oneself in social science is Burrell and Morgan (1979). They provide a similar map to Hollis's which is, however, organized somewhat differently around the binaries objectivism/subjectivism and *regulation/ conflict*. Because one axis is the same, there are 3 independent dimensions and the epistemological space thus defined can be drawn in 3-D space, as shown in Figures 2 and 3. These diagrams were originally meant as a tongue-in-cheek 'engineering view of social science', but can serve as useful mnemonics all the same.

As shown in these figures, some social science theories assume that harmonious coexistence is possible. These tend to draw on biology to imagine social systems as (potentially) healthy organisms and were popular in the latter part of the 19th Century (e.g. Emile Durkheim) but also as recently as the 1950s (e.g. Talcott Parsons). According to Burrell and Morgan such theories belong to a 'sociology of regulation'.[1] By contrast, other theorists, such as Marx, see conflict as a permanent property of social systems; these theories belong to a 'sociology of radical change'.

The political theory of Chantal Mouffe (1992, 2000) is particularly helpful in this context, because she advocates a concept that could be said to fall in the middle between these extremes and that she calls *agonistic pluralism*. With agonistic pluralism Mouffe gives up the possibility of reaching a Habermasian consensus through dialogue and accepts that irreconcilable idelogical differences may persist. However, she rejects sterile political polarization and advocates a political environment based on mutual respect and constructive

[1] As a reflexive note, my own training in engineering propels me towards the sociology of regulation and harmonious organicistic and systemic models. However, I rely on such conceptualizations more as rough and intuitive mental models than an actual epistemology. For example, the possibility of a potential dynamic equilibrium that is discussed in the later sections of this paper should be seen merely as a device for facilitating the explanation of a difficult and uncertain process of discovery and negotiation that depends heavily on the local context and is unlikely to be perceived as harmonious at any time by the people directly involved.

engagement – and may the best win! The tradition of political theory that I am identifying with Mouffe is referred to as 'radical democracy' and is based on a commitment to political participation *also in economic life*. As I argue below this is more easily accomplished at the local level than within the current context of the nation state.

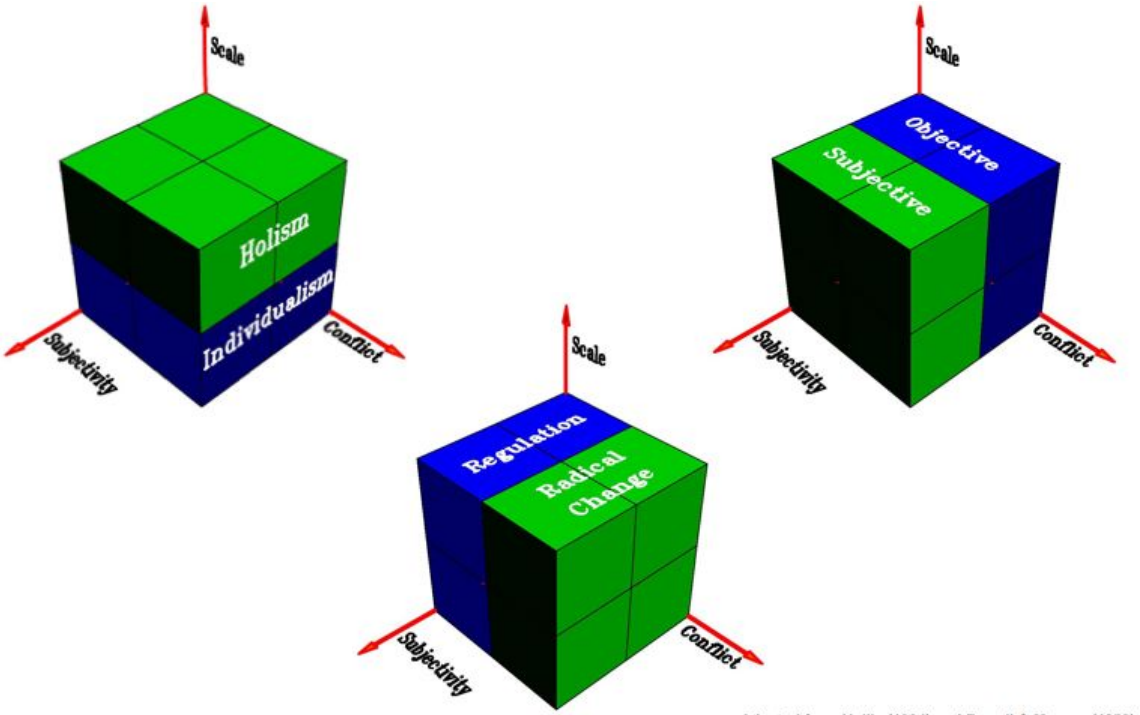

Figure 3: Three dimensions of social science

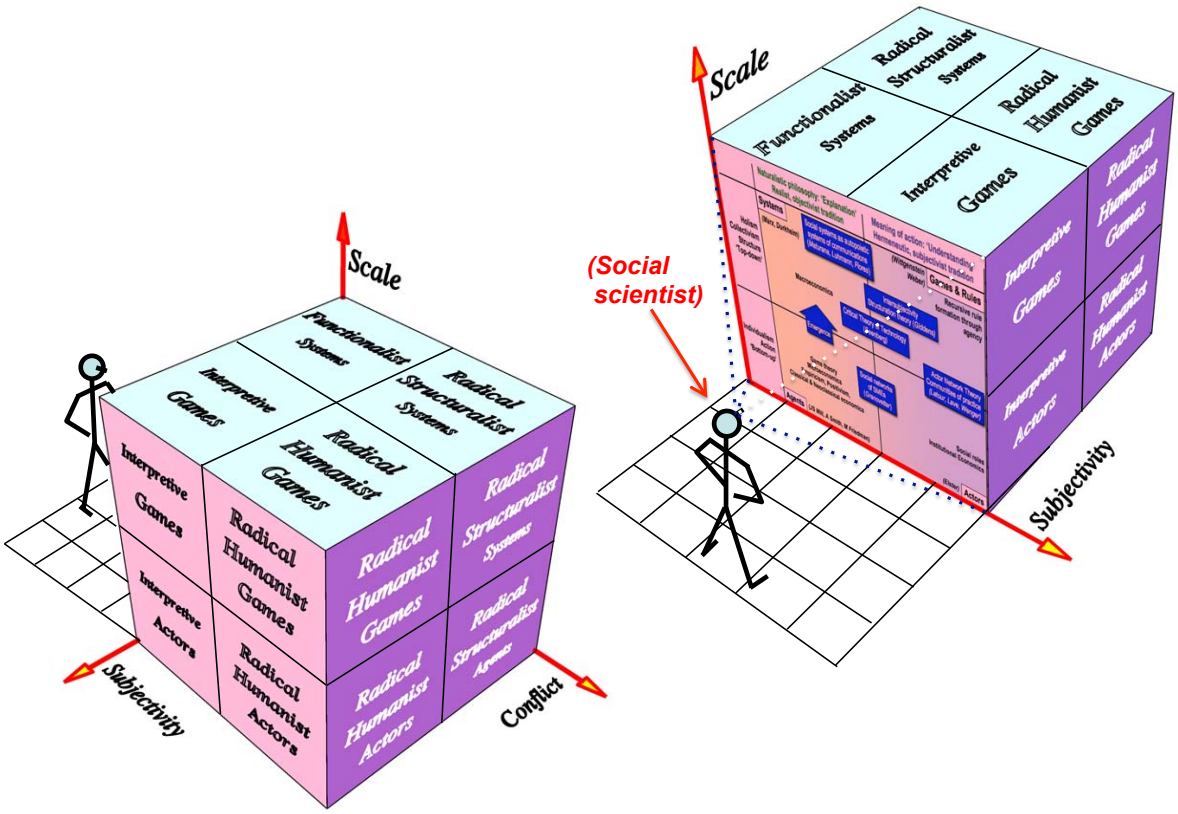

Figure 3: A more detailed view of the 3D map of social science

Domains of Value

The final fundamental dimension of social science, based on my experience so far, is *value*. The motivations for extending the scope of the concept of 'economy' beyond the market are various, ranging from political ideology to business innovation, but what could arguably be regarded as the most important motivation remains rather subtle and difficult to understand because it challenges the preconception 'Economy = Market' that has by now become deeply ingrained in our collective consciousness.

An extension of systemic economic relationships beyond the market has been developed within the field of economic anthropology, for example as discussed by Gudeman (2001). Economic anthropologists study the forms of value creation and exchange that characterize different human cultures, including the Western. All economies strike a balance of market or commodity-based production and exchange and non-market and commons-based production, sharing, and exchange. But Gudeman proposes a more granular classification of value domains which, importantly, is also dependent on scale: (1) base or commons, (2) social relationships, (3) accumulation or capital, and (4) trade or market. The first two are prevalent at smaller scales and are closely associated with community, whereas the latter two tend to involve longer-distance interactions and are more impersonal. However, the domain of accumulation is equally important for community and for the market.

The dependence of the value domains on scale is well captured by Figure 4, which shows a schematic after Gudeman's own graphic of how a local economy based on use-value relationships can interface to a wider market economy that can span and connect multiple communities. The diagram shows a rather intricate interdependence between different parts of the economy, of which the market is emphatically only a part and in which the value of social relationships can be recognized to have a central role. In such an economic framework the market exchange of commodities coexists alongside other economic mechanisms such as the sharing of public goods, barter, gifting, and reciprocity. The figure also implies that different mechanisms are operating at different scales and in different institutional contexts.

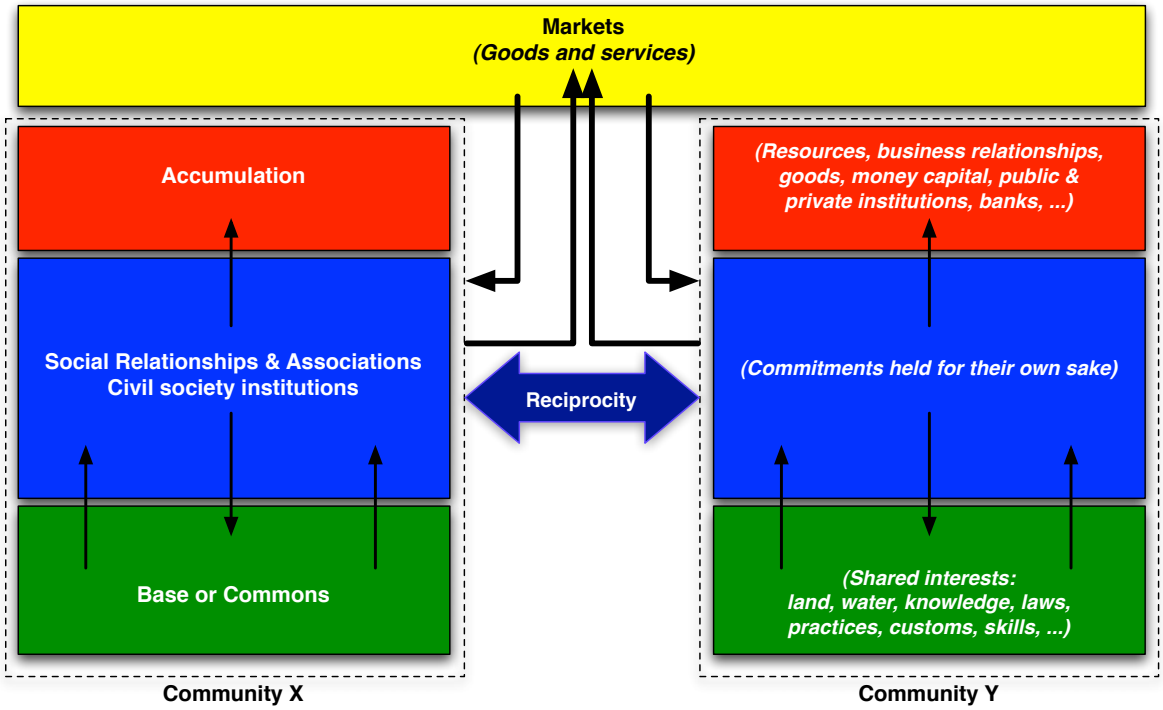

Figure 4: Domains of economic value

To begin understanding this figure it helps to note that 'the base in a system of social value is the counterpart of capital in a system of commercial value' (Gudeman, 2001: 33). Unlike commercial capital which is usually measured with a common metric, i.e. money, the values in the base are measured in many different ways that depend on the type of base and the type of community. However, the function of base and capital to 'store' savings that, for example, can be accessed in hard times is analogous. The figure shows the domain of accumulation as belonging to the scale of community because Gudeman's perspective emphasizes the real economy rather than the economy of financial markets. The fact that his object of study has predominantly been the village community in various 'developing' countries probably also influences this interpretation.

The economic anthropology analytical perspective advanced here, which could be said to have orginated in the work of Polanyi (2001[1944]), is helpful in understanding the strong link between open source software as a Commons and its corresponding open source software communities of developers. As Gudeman says, one cannot have a community without Commons or a Commons without a community.

For all this, one should be careful not to get carried away by the 'warm and fuzzy' Gemeinshaft connotation of community. Whereas communities need a shared set of values (which often serve as a more abstract form of Commons, e.g. various cultural forms), they can also be stifling if a single view of things is assumed or if the shared set of values is exclusive of all others. It is best to regard the shared values as the *intersection* of the values held by the community members, rather than a single set common to all. Secondly, too much cooperation can lead to cartels, which undermine market dynamics. Thus, there is some more work to do before the possibility of a healthy balance between these different positions can begin to appear possible.

Institutions and Scale Effects

The social constructivist lens being used here is compatible with the anthropological perspective due to the strong emphasis the latter places on culture and cultural forms. In other words, the economy can be seen as a product of cultural expression, and money itself as a cultural form. For example, the symbols, mottos, and historical personages inscribed on coins and banknotes resonate strongly with feelings of national and collective identity.

The field of institutional economics complements well economic anthropology because it espouses a view of economy that is explicitly interlinked with social structure, not unlike Granovetter's economic sociology (1985). Institutional economics was founded by Veblen and one of its clearest modern commentators is Geoffrey Hodgson (1988): 'The term "socio-economic system" is used to emphasize the fact that the economy is inseparable from a host of social and political institutions in society at large' (Hodgson, 1988: 15); where an 'institution' is defined 'as a social organization which, through the operation of tradition, custom or legal constraint, tends to create durable and routinized patterns of behaviour' (Hodgson, 1988: 10).

In his theory of structuration, Giddens (1984), a sociologist, views institutions as structures that result from emergent and bottom-up social constructivist processes but that, once established, can act as constraints on the choices and behaviour of the inviduals that compose them. In spite of such constraints, the existence within institutions of social processes mediated by language enables a process of self-renewal, albeit at a much slower time-scale. Thus, structuration offers a way to reconcile the individualistic vs. structuralist dichotomy of socio-economic action depicted in Figure 1.

The range in the types and in the scale of institutions is enormous: the family, the Catholic Church, a small company, a multi-national corporation, a hospital, a university, the stock

exchange, etc. More to the point, private institutions have a legal personality, which means that they have the same rights as individual citizens. But they can be very large. Given that how institutions form and how they behave or can be controlled is not yet very well understood, one can start to see how significant power imbalances can emerge.

Furthermore, it is interesting to note that in Southern European countries the term 'institution' can carry a significant *negative* connotation, whereas in Northern European countries this term is much more neutral, and in some cases it carries a *positive* connotation. I see this as a reflection of how the different levels of democratic maturity between different parts of Europe influences the 'culture' of the institutions that emerge from the respective social constructivist processes and, therefore, ultimately also the experience of the individuals that interact with them. This is an important element of the discussion to follow.

3. MONEY, THE HISTORY OF DEBT, AND THE UNHOLY SPIRAL

David Graeber, an anthropologist, recently published a very insightful, extremely well-researched, and rather upsetting book on the history of debt (Graeber, 2011). Trivializing a bit his main points for the sake of expediency, he shows how the concept of private property originated in slavery and how the roots of money are linked to violence and war. The violent dimension of money is better understood through the phenomenon of lifelong debt bondage, which amounts to slavery or worse, rather than through its association with war. Whereas Graeber's work could provide plenty of ammunition for an ideological assault on the foundations of capitalism, I prefer to leave such metaphors, in word or in deed, aside and to focus on the structural points he made, which to me are far more significant and far-reaching.

There are two main points that I want to use here. First, Graeber explains that money was invented approximately 4000 years ago to pay soldiers that were stationed in or near a given village or town. So, how did economies work before money was invented? Apparently credit notes and individuals' memory about who owed what to whom were sufficient to make small-scale economies function perfectly well. A certain level of mutual accountability and trust was required but the normative framework of a given social context can usually provide that without expending additional effort beyond the governance that organizes the village or the family. The problem, on the other hand, was that soldiers usually came from other towns or even other countries, so they were disconnected from the local social networks. Governments therefore invented the ingenious mechanism whereby coins would be minted to pay the soldiers, who would spend them in the local shops, such that a portion of the same coins could then be recouped by the government in the form of tax. Of course, the depersonalization of economic exchange that money brought also allowed economies to scale up in size and geographical extent more easily than the social relationships between villagers, so this is a positive effect that we need to keep in mind as we develop the analysis further.

The second point concerns money interest, which has been around as long as money. I could not possibly reproduce here the wonderfully detailed and eloquent 400-page discussion of interest and debt that Graeber offers. I will just say that the introduction of interest strengthened the 'store of value' property of money (in addition to the 'unit of account' and 'medium of exchange' functions) that it had by virtue of being made of precious metals or being a token for so much gold. In other words, the perception that money has intrinsic value entered in our cultures in such a pervasive way that it still applies today, long after the gold standard has been abandoned. Modern money carries value only by *fiat* ('let it be so') and consensual agreement.

In lieu of a proper study of the psychology of money, one could venture to say that the fact that we tend not to be aware of social constructivist processes leads to the paradoxical situation

where we tend to allocate value to money, as if it were gold, even though we do not quite understand what the 'essence' of money is. In other words, money appears to become reified and objectified while at the same time remaining beyond our grasp and, for this reason, invisible because the concept of social construction is so strange and abstract. The depersonalization of money and the introduction of interest exacerbated this divergence between perception and understanding, making it easier for money to acquire a 'mythical' life and fetish quality of its own in the collective imagination. The consequent question of the intrinsic value of gold, diamonds, and so forth is also extremely interesting from anthropological point of view (and rather puzzling from a physics point of view), but exploring this point would carry us too far from the present discussion.

The paper has now set up two of the three elements of the unholy spiral, shown in Figure 5. The third element can be variously called 'progress', 'growth', 'utility maximization', 'drive for survival and territory', 'greed', 'social status', or a combination of the above. Whether the basis of the human drive to acquire wealth and territory is biological or cultural/socially constructed, the important point is that it feeds on our perception of money as something that should be hoarded and held since its value will increase over time, and is not checked by social constraints given that it has been a depersonalized and disembedded medium of economic exchange for thousands of years in many human cultures – and especially in the Western culture.

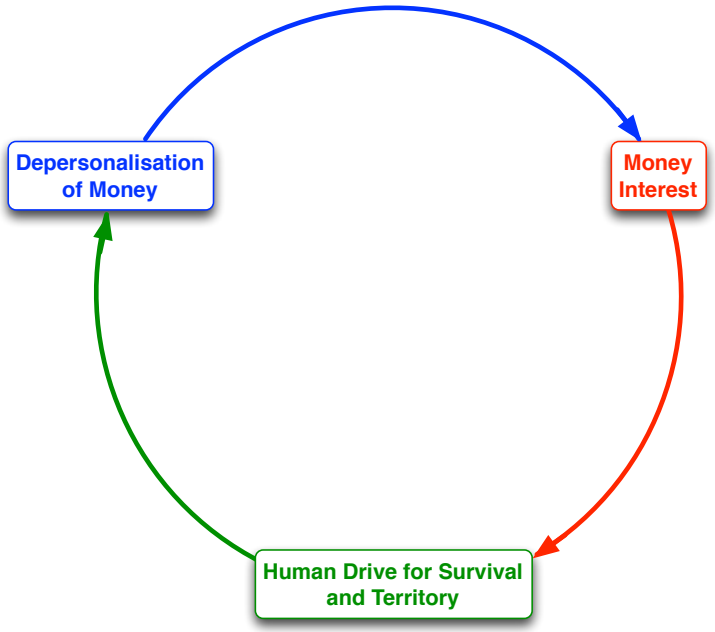

Figure 5: The unholy spiral[2]

Having followed Gudeman's distinction between market and economy, we now follow Graeber who draws another distinction, this time between the market and capitalism. This had already been taken into account by Gudeman, to be sure, but by focusing on the effect of interest now Graeber can highlight the difference as follows (paraphrasing): in a market money is used as a medium of exchange, in capitalism money is used to make more money. So the market and capitalism are not *necessarily* the same thing.

[2] Technically, this is not a spiral, and the geometrical object I have in mind is actually a (downward) helix. But I like the term spiral better.

This makes us feel better about the market – perhaps it does not have to be dehumanizing after all. At the same time, this does not mean that capitalism is necessarily and unequivocally 'bad'. Without entering a detailed discussion of the good or bad aspects of capitalism, one could just say that for some kinds of economic transactions some level of interest is useful and fair, while for others it is not (e.g. loan sharks). It could also be said that whereas the financial economy originated for good reasons, to support the real economy, it has since in large part gone out of control and lost sight of any function or purpose other than to make ever-more money out of money. Furthermore, the current economic system seems rather crude and unsophisticated: the same mechanism and the same unit of account, medium of exchange, and store of value applies at all scales, from the newsstand to financial markets, and it is mostly self-serving rather than in the service of society.

Now, the crux of the argument of this paper involves combining the unholy spiral with the scale effects of institutions. Let's lump joint-stock companies – normally referred as 'public companies' – with companies whose equity is held in private hands as 'private institutions'. Such institutions have a mandate to maximize profit for their shareholders. Because they can be very large and have the same rights as individuals, they become effectively 'lumbering giants' that roam freely among us. It then becomes apparent how even their perfectly legal actions can wreak havoc among smaller players – which often include governments, not just small companies or individual citizens – and/or the environment. This is then what I was referring to as the 'structural' aspects of the current political economy landscape: the formation of institutional structures, through social constructivist processes, whose logic is influenced by an uncritical and haphazard evolution of money as a cultural form that has fed and continues to feed the most basic human instincts in a way that is destructive for the individual and for society. It is our poor understanding of the interaction between the biological and cultural dimensions of human actions and motivations combined with the emergence of these 'dumb and hungry giants' that spells disaster.

The political and ideological battleground has largely been around the moral philosophy that condemns or celebrates different aspects of human nature. I contend that a better understanding of social systems through social science has now given us the tools to identify one of the important roots of the problem – if not the *only* root – and that we are now in a position to change it. Therefore, I advocate a type of action that prioritizes a gradual cultural transformation process over political struggle, which in any case I see as a losing battle given the forces at play. In particular, since money appears to play a role in socio-economic processes that is analogous to the role of language in social constructivist processes, changes to the properties of money will percolate to and permeate every aspect of the economic culture. Therefore, it may be possible to find a currency design that has the potential to 'starve' the giants. The next section outlines the properties of one such system.

4. COMMUNITY CURRENCIES AND A POSSIBLE STRATEGY FOR LOCAL ACTION

Having acquired the rich anthropological perspective of Gudeman and Graeber, it is now easier to see and appreciate the struggles of indigenous and traditional peoples around the world as they try to resist the corrupting influence of the Western capitalist economy or simply try to survive in the face of displacement and annihilation of their economic spheres or the environment by large multinational corporation with huge market power. For example, as explained by one of the Roundtable participants (Nigel Haggan), the First Nations tribes of British Columbia, represented at the Roundtable by Chief Beau Dick, see the spirits inhabiting natural forms as their relatives. Therefore, they do not 'protect' them because that would be condescending, but they do not exploit them to extinction either! The objectification of nature characteristic of Western culture makes it possible to exploit and destroy the environment.

This contrast is very similar to the difference between socially-embedded local credit systems and the depersonalization of economic exchange brought by money as we know it.

Unfortunately, the rising importance of individualism and individuality that modernity brings makes it increasingly difficult for traditional cultures to hold on to the values they know to be important for cultural and individual survival. Even if we rule out the individualism of neoclassical economics, individualism in terms of personal freedoms and personal rights is important as a foundation for democracy, which to most of the world's peoples seems to be an ideal worth striving for. In fact, individualism is also the basis of social constructivist processes, and as such it is, as this paper has argued, the starting point for the construction of democratic processes and institutions.

How can this often tragic situation, thus, be approached in a constructive way? It seems wise to look for a solution that is compatible with the prevailing economic system, so as not to be perceived as 'deviant', revolutionary, or worse. The foregoing analysis and discussion suggests that, therefore, a different kind of currency should satisfy the following requirements for the economic system it mediates:

- compatible with the wider (capitalist) market economy and dynamics
- compatible with and accountable to fiscal policy
- supportive of local/small economic players
- socially embedded
- free from the corrosive effect of interest-based money capitalism
- resistant to the market power of the larger players

There have been many experiments with different kinds of community currencies, for example the LETS system invented by Michael Linton on Vancouver Island in 1981 (Croall, 1997); or the WIR system established in 1936 in Switzerland and currently counting 60,000 small companies as members (Dini, 2012); or the credit notes systems that emerged in 2001 in Argentina when their banks collapsed; or the thousands of other experiments around the world that have been around for thousands of years. These experiments tend to emerge in times of economic crisis, when the prevailing money-based systems run aground; in such situations people rediscover their ability to create wealth and to build an economy from nothing, starting from mutual trust and labour.

Some of these different types of community currencies are discussed in my working paper (Dini, 2012) and in the references therein. For the purpose of this discussion I see community currency systems as important in three ways:

1- they can be regarded as 'laboratories of institutional learning'. This increases the democratic awareness and maturity of the communities that adopt them because the management of such currency systems and the participation by the community members in a governance process based on transparency, accountability and trust are one and the same thing.
2- community currencies help us understand how to 'colonize' economic value with social value, in direct contrast with the commodification of social value that we see, for example, with the marketing of Google or Facebook analytics in social networks.
3- If money as a medium of economic exchange plays the same function in economic processes as language plays in social processes, then community currencies can *catalyze* the social construction of economic identity and a sense of economic empowerment and independence that is vital for giving back hope to marginalized and disenfranchized communities.

A community currency experiment that started after the most recent banking crisis and that is going strong is Sardex.net, based in Sardinia (http://sardex.net). Sardex can also be regarded as a multilateral barter system and is modelled after the Swiss WIR, but has adopted some elements of the LETS system. After 4 years, the Sardex circuit has 2000 member companies

throughout Sardinia, it has achieved national and international recognition, and it is now being replicated in six other Italian regions.

The central concept of the Sardex or the LETS system is best explained by a figure, see Figure 6. The sum-total of all accounts is always zero by definition. Each transaction is essentially a zero-interest loan that is mediated by the central credit-clearing service. Sardex is currently at zero interest and only relatively small B2B transactions are allowed. It is not clear whether they will move to larger loans such as mortgages and, like the WIR, in that case start charging interest. If that were to happen they would acquire an institutional structure that is closer to a cooperative bank (EU), building society (UK), or credit union (Canada, US), similarly to the WIR Bank. Each transaction is mediated by the central server, thus everything is invoiced. This means that there is total fiscal transparency. Each member signs a contract upon joining in which they commit to a certain amount of economic activity, with upper and lower caps on credit and debt, respectively. Membership for individual citizens is being considered, where such members would not be allowed to go negative (acquire a debt) but could spend Sardex credits in shops that accept them if they have a positive balance. They could acquire credits as part of their salaries from local employers. All transactions are currently being conducted with a phone app.

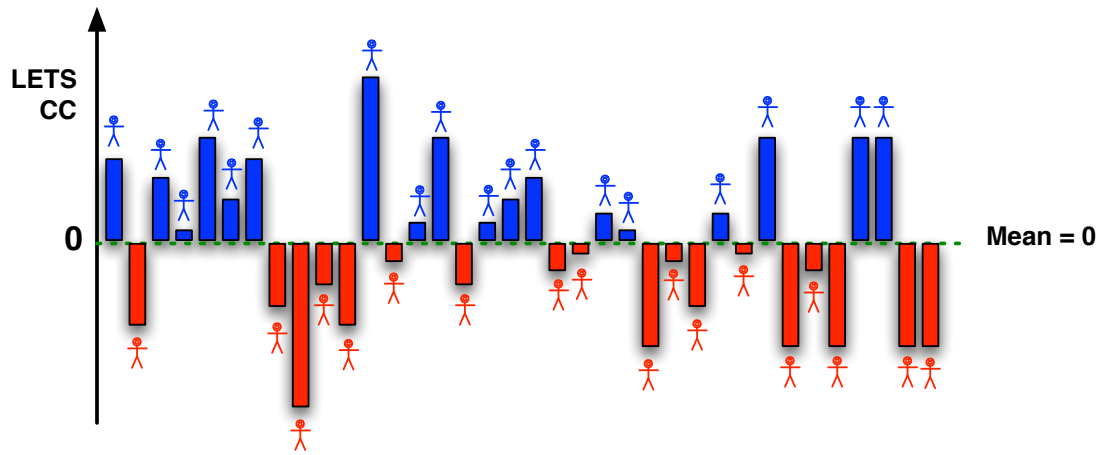

Figure 6: Distribution of Sardex credits showing members in debt and in credit. Total sum is always zero by definition. Stick figures represent companies, not individual consumers.

Transactions are carried out in variable percentages of credits and national currency. Thus, many trades would not be possible without the credits, which means that there is a positive effect on GDP due to the presence of the parallel currency. In peripheral economic communities the most common problem is a negative balance of trade, which means that they import much more than they export – often what they produce is not competitive. As a consequence, money tends to flow out of such communities, and their economies struggle due to the loss of the medium of exchange. A parallel currency provides a medium of exchange that cannot be carted off to the central bank to be invested in the financial markets, because it has no meaning outside of the community. Furthermore, trading within the economic circle leads to the beneficial effect of 'import substitution', more fully explained in Dini (2012), whereby membership of the economic circle leads to the 'substitution' of goods and services that could have come from the outside with goods and services provided by other members of the circle. Finally the LETS-style structure of Sardex is preferable to physical community currencies that can bought with or exchanged for the national currency. Even when the unit of account is fixed (e.g., £1 Brixton Pound = £1 GBP) and therefore speculation based on a floating exchange rate (like Bitcoin) is not possible, the isolation from or independence from regular money is not complete. Sardex cannot be bought or sold for Euro, and 1 Sardex credit = 1 Euro.

There are many other technical details about the Sardex that should be thoroughly understood before attempting to replicate it. It is interesting to note, however, that none of the founding members of Sardex is an economist or a software engineer. They are all humanists, which is actually quite telling. In this brief summary the idea was to give a flavour for the very real possibility to create an alternative economy that is compatible with the prevailing capitalist market economy, that can live side-by-side with it, and that relies on local solidarity and non-capitalist market exchange. I close with a visualization of the WIR bank using the colour code of Gudeman's domains of value, in Figure 7.

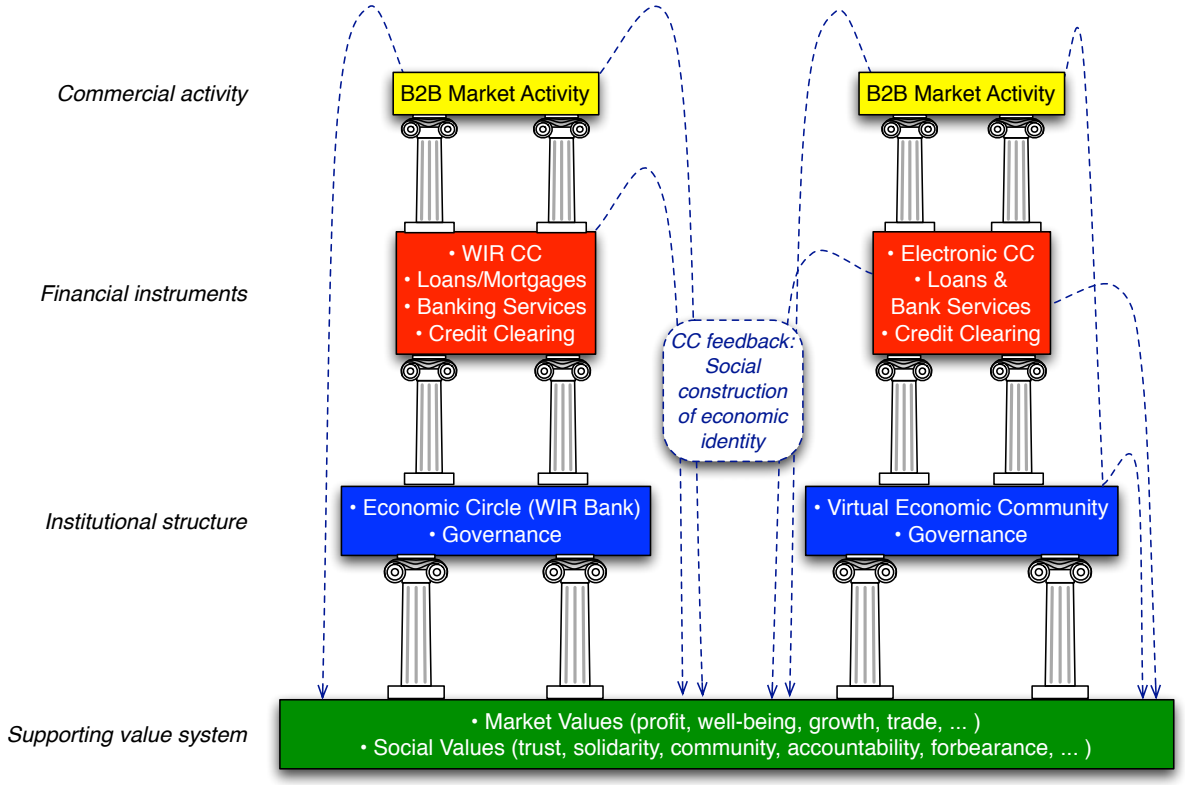

Figure 7: Visualization of the social construction of economic identity

5. CONCLUSION

In conclusion, I hope this paper has provided enough evidence for a diagnosis of what appears to be one of the most difficult and fundamental problems of modern society: the cultural roots of money as a flawed medium of economic exchange. Money should not be eliminated, and neither should interest, completely or unilaterally; and capitalism is not necessarily destructive. We do however need to start a more serious and *more sophisticated* study of some of the monsters we have created, in order to bring them back to their original functions to serve society rather than destroying it and its environment. If many local examples of community currency such as the one outlined here were to spring up around the world, for example in connection with local fishery or analogous 'business ecosystems', within a couple of decades a better understanding of what money is may infiltrate the public's perception – along with the fact that we can indeed take control of this all-important element in the social construction of our reality, economic well-being and, ultimately, environment.

6. ACKNOWLEDGEMENTS

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